

NAVY MEDICINE

September-October 1991



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COVER: On 15 June 1991, long dormant Mt. Pinatubo erupted on the Philippine island of Luzon. The fallout from that eruption permanently closed Clark Air Force Base and put a serious strain on operations at the Subic Bay Naval Base. How Naval Hospital Subic Bay dealt with this natural disaster is this month's cover story on page 4. Photo by CAPT Karin Jackson, USAF.

Then and Now

I am pleased that this issue shares an interview with Admiral Ben Eiseman. I remember well my first meeting with him. I was a lieutenant commander at the time, on my third tour in Vietnam. He came out and spent a day with us in the Mekong Delta. His presence, his attention, was very important to us. Admiral Eiseman's "assist visit," to use today's terms, put a very different professional perspective on serving in a combat environment.

My first tour in Vietnam was the most difficult; war was new to me, and our country had only recently begun active participation. It was 1965, and I was the surgeon, a lieutenant, in a one-room aid station on the beach at Chu Lai. When the casualties began to come in, we had room for one stretcher at a time in that tent.

My second tour was aboard the hospital ship *Repose*. It was small, cramped, and crowded. The tiny rooms and elevators, vertical ladders, and narrow halls were not conducive to good patient flow. But the ship was a haven away from the battlefield. It had the right kinds of conditions to help heal the battle-torn; it was clean, filled with an attitude of caring, and had the feel of being back home. It was aboard *Repose* that Navy psychiatrist Jim Sears began to formulate the concept of SPRINT (Special Psychiatric Rapid Intervention Team) teams, which have proven so crucial in helping our people cope with the horrors of mass tragedies, whether in times of peace or war. We were also the first ones to do open-heart surgery at sea. The technology was there, but it was nothing compared to what's available today aboard *Comfort* and *Mercy*, especially in monitoring capabilities with their floating CT scans and other high-tech equipment. Also, today's converted tankers have ample space, having been designed with patient flow in mind.



My third tour in Vietnam, during which Admiral Eiseman visited, was a joint operation of the Army and Navy and was marked by the efficiency of medical support. The Army had dedicated medevac helos that would land on Navy ships where Army surgical teams were waiting. This need for integration and cooperation among the services, and also among the allied nations, was reenforced during Operation Desert Storm.

Also reenforced was the correctness of the plans and preparations made by the Navy Medical Department following our experiences in Vietnam. We made tremendous progress, having on hand and ready not only the hospital ships but also the fleet hospitals.

However, we cannot rest on the laurels of our response during Desert Storm. As expected, we found areas that needed improvement, and we're working on those. We must constantly reassess our capabilities, and always remain focused on our mission: to make sure that sailors and marines are fit to fight and that we are ready to support them wherever and however necessary. Operational readiness will always be number one; it has to be.

CHARLIE GOLF ONE.

VADM Donald F. Hagen, MC

SG Remembers Promise

It was night in the springtime and LT Donald F. Hagen, MC, dreaded what was soon to happen. When the gunfire began, just after nightfall, the first casualty came in—a young marine with multiple wounds from a .50-caliber machine gun. "Nothing quite prepares you for it," VADM Hagen says. "It was a shock that first time. We did not know what was about to happen."

What happened was casualties, many of them, and they were poured into the small, one-room aid station on the beach at Chu Lai, with its medications along one canvas bulkhead and suction equipment along another. There was room for one stretcher at a time.

That night and for many nights to come, Dr. Hagen, new to the Navy Medical Corps, was introduced to the nuts and bolts of combat medicine. It was, he says, an awakening. "In that tent, I promised that if I ever got the chance, I'd do something, whatever I could, to help our men and women, to improve things for Navy medicine," he adds.

Twenty-seven years later, Hagen gets that chance. Now a vice admiral, he took over 28 June 1991 as the 31st Surgeon General of the Navy and Chief, Bureau of Medicine and Surgery. It is, the Surgeon General admits, time to keep the promise.

"Lately, I've been thinking a lot about those days," Hagen says. "Looking out of a tent in Vietnam you get a different perspective. Now I can deliver. I am sworn to take care of the troops. Our primary purpose is and always has been to support the sailors and marines in combat."

As the new Surgeon General, Hagen has already begun a review of lessons learned in Desert Shield/Storm, an operation in which Navy medicine was lauded for its performance.

"We have questionnaires out to all the people we had over there," Hagen points out. "We want to know from the medical personnel who were in Desert Storm where we can make improvements, if there were any events for which we were unprepared."

Such a study, begun under Hagen's predecessor, VADM James A. Zimble, will take several months to complete. Hagen also plans to use Navy medicine's flag officers to make long-range strategies.

"They will be a sort of governing board," Hagen says. "They have to be involved. My hope is to get them together, perhaps twice a year, to help lay out our future course." He also sees more interservice cooperation to pool medical resources.

"I want to work together jointly and to cooperate, and the place to effect that is at the local command," he



explains. "That should be done without us at headquarters having to force the issue. The war in the Gulf helped us a lot on this issue. The services worked together and shared as never before. It proved we can work together. If we can do it in wartime, we can certainly do it in peacetime."

Partnerships will also be increased with civilian medical agencies, he says. His approach is the same he has used throughout his naval career. From the time he was commissioned in 1964—shortly after graduating from the medical school at Northwestern University, Chicago—Hagen's main emphasis has always been on making it easier for medical personnel to do their jobs and on taking care of patients.

Prior to taking over the Bureau of Medicine and Surgery, he was Commander of the National Naval Medical Center (NNMC), Bethesda, MD, where he handled a major reorganization and directed services there during Desert Shield/Storm.

To build his concept at NNMC,



LCDR Hagen conducts sick call during a MEDCAP operation in the Mekong River Delta of South Vietnam.



Hagen focused on "Treat Everyone As Me" (TEAM) training. "All who come to work at this command (NNMC) undergo classroom training in this philosophy," he said. "If you are working somewhere and someone needs your help, it is the right thing to do to provide that help. Everyone is a customer of someone else. We must always be ready to help people," Hagen added.

"I've always been blessed with having great people around me. Many simply needed to believe in themselves, to work in a place where they could concentrate on practicing medicine and the right to take risks once in a while without fear of being hammered."

Although he has risen to the Navy's top post in the medical community, Hagen did not begin college at Concordia College, Moorhead, MN, with plans to become a doctor. Originally he was an English major but after discovering he was better in science, he transferred to premed. He was the first child to graduate from college in a

family of European immigrants, who began their American experience in a sod hut on the prairie. His grandparents came to America from Norway and England and became farmers in North Dakota. His father was born and raised a farmer as well.

Hagen joined the Navy even though he had no family link with the sea services except for an uncle who served in World War II but never talked about his experiences. The Navy sent him to work with the Marines at Camp Pendleton, CA. "I didn't really know there was a Marine Corps," he says.

After his 2-year tour, he planned to get out. Then he was assigned to the hospital ship *USS Repose* (AH-16). It changed his mind, his career, and his life. "That said to me, this is Navy medicine and I should stay around. There are sons and daughters of Americans who need our care. We did hundreds of operations aboard *Repose*."

But after 27 years it all comes back to that promise he made while treating

casualties in Vietnam. And it is summed up in his Parable of the Butterflies:

"I asked a question at Bethesda last year. Where are the butterflies? I'd seen them the year before. They were all over and they were beautiful. Suddenly there were none. I realized we had sprayed for gypsy moths and not protected the butterflies."

"Well, we have butterflies in Navy medicine, too—the little guy who doesn't get much recognition, who has traditionally taken second place to others, the small clinics, and the plastic surgeons who have a hard time getting time in the operating room."

"We have to take care of the butterflies." □

—Story by JOC Walton Whittaker, BUMED Public Affairs. Photos courtesy of Mrs. Karen Hagen.

Black Saturday

On 15 June 1991, the Philippine volcano, Mt. Pinatubo, dormant for 600 years, violently erupted, becoming the greatest natural catastrophic event of the century. The products of that catastrophe—rock fragments, searing lava, sand, and ash—were thrown far from the mountain; some material reached heights measured in thousands of feet. Combined with continuous earthquakes and a 100-kilometer-per-hour typhoon, one could not help but wonder if this was the beginning of the end of the world. Several provinces in this mostly farming community of Central Luzon were blanketed with a foot of sand. Even the U.S. Naval Hospital (USNH) Subic Bay, located 8 miles south of the Subic Bay area, was not spared.

The jungle where USNH Subic Bay is located became an eerie landscape straight out of a surrealist nightmare, an unbroken expanse of deadly gray ash and sand. Bare trunks of coconut trees looked like half-opened umbrellas poking from the desolate landscape, hardwood trees were stripped bare of branches and leaves, giant fruit

trees were split apart by the weight of the sand, and bamboo trees lay about snapped like matchsticks.

Few people, including area natives, knew about Mt. Pinatubo prior to newspaper reports in early March. What was known was that it was a seemingly extinct volcano emitting steam and smoke 8 miles from Clark Air Force Base. As volcanic tremors and other seismic activity began to increase, Philippine and U.S. volcanologists began monitoring the volcano with increasing concern.

Evacuation

Finally, after much deliberation, Clark AFB personnel were evacuated on 10 June to the Subic Bay Naval Base 40 miles away. With sudden evacuation of more than 15,000 Air Force personnel and their dependents, the USNH Subic Bay staff assumed responsibility for a total beneficiary population of approximately 30,000, twice its normal load.

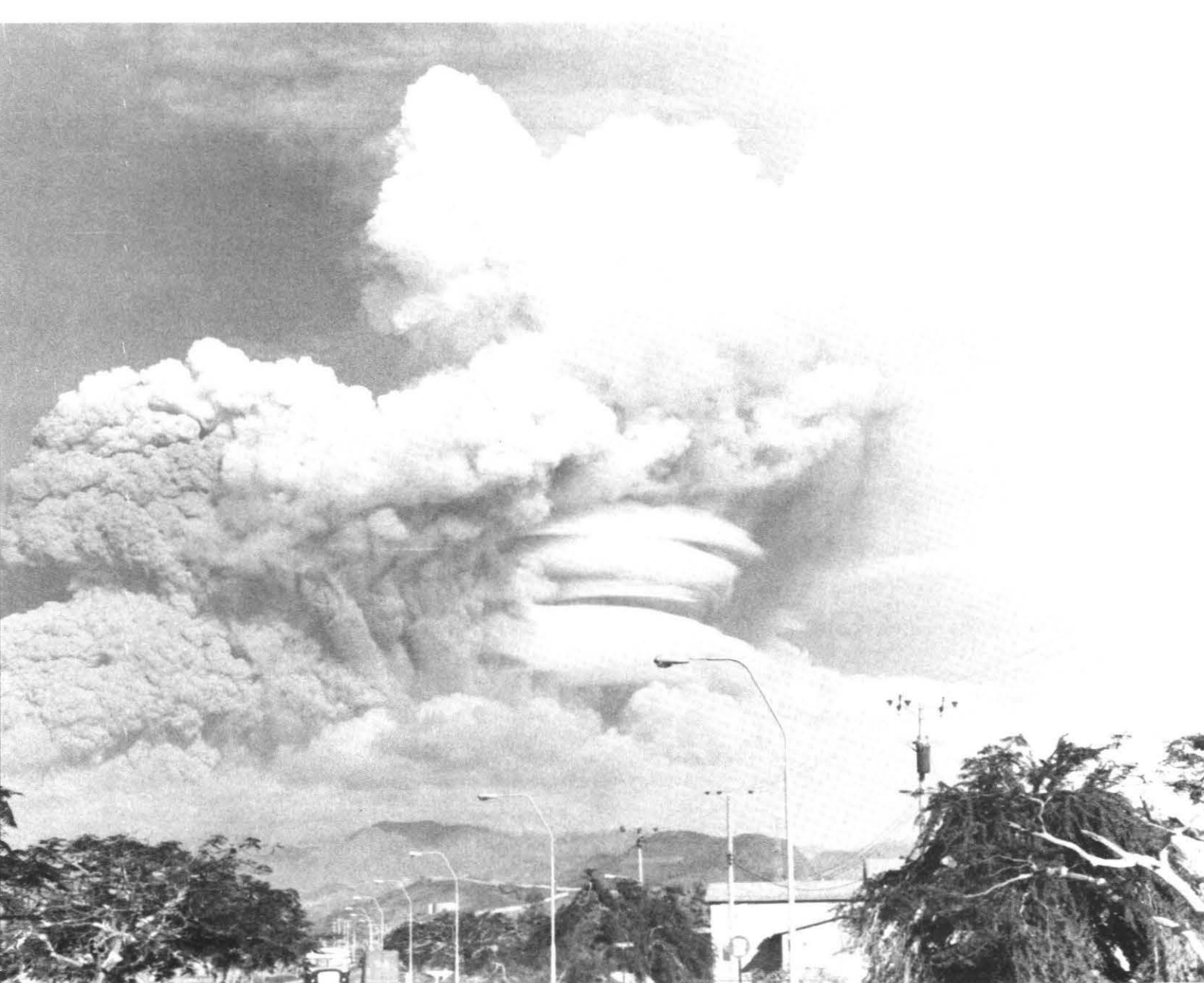
The staff of the 13th Air Force Medical Center and USNH Subic Bay were immediately integrated to service the combined beneficiary population.

Numerous Air Force staff, their dependents, and the next-of-kin of patients opted to stay in improvised quarters at the hospital. The emergency room visits and inpatient census doubled quickly, and this usually quiet hospital became a busy medical center almost overnight. That day alone, the hospital inpatient census rose to 48, 30 percent above the average inpatient census. With the Air Force staff augmenting our personnel, the increased workload was not strenuous.

The Awakening

On 12 June, the first major eruption occurred, appearing as a gigantic show of force. A giant mushroom cloud of ash and sand spread over the facility but was blown out over the ocean. Several inches of ash fell on San Miguel, a partially deserted Naval Communication Station that was being used as a bedroom community.

Staff from the Industrial Hygiene Department quickly initiated sampling of airborne volcanic ash, collecting filtered air samples for analysis by labs in Hawaii and Utah in order to provide timely information to COM-



Mt. Pinatubo vents its wrath.

Robert S. Culbreth

USNAVPHIL on potential health risks.

On the afternoon of 14 June, the eruptions began in earnest, spreading a pall of ash that turned to mud as a low-pressure system approached. Then, early on the morning of the 15th, the eruptions intensified. A massive roar and boom was heard and then a huge black cloud billowed skyward as the sky began to darken. More blasts followed and by noon it grew very dark. Lightning flashed with a continuous roar of thunder. Rain began to fall accompanied by ash which turned into a white-gray mud that stuck to the roof of the hospital

buildings and power and transformer lines.

Power was soon cut off including our big generators that utilize the same power and transformer lines. A small 60kv generator remained on line to several critical areas in the operating room, emergency room, and ICU. All communication systems, except the base Montezuma Net, ceased operating as reports came in of buildings collapsing from the weight of the ash. Due to loss of telephone communications at the hospital, including the ambulance call line, the Subic Branch Medical Clinic commenced 24-hour phone watch until 29 June, relaying

messages to the hospital by radio. During this period, 202 ambulance runs were dispatched through this improvised process.

Personnel continuously monitored ash accumulation on the roof of the main hospital building, and at about 2130 the executive officer, CDR V.M. Peters, MSC, and a working party of 30 Navy and Air Force personnel began removing a 6-inch accumulation of ash from the roof.

Although the buildings had survived, the main concern was water or lack of it. A 700-gallon "water buffalo" provided drinking water, but operating room linen could not be laundered



Above: A forklift modified as a mini front loader helped clear volcanic debris from the hospital grounds. **Top right:** Volcanic ash blankets the commanding officer's vehicle. **Bottom:** Although this scene might resemble a post-snow-storm cleanup, the volcanic ash had the consistency of heavy sand.

until USS *Cape Cod* arrived and provided much-needed sterilizing and laundry support. Following the eruption of 15 June, teams were sent throughout the U.S. facility to identify, assess, and recommend solutions to problems concerning food service sanitation, habitability, sewage, and garbage disposal. From 10 June to 9 July, including the pre-eruption evacuation period, these teams performed 311 sanitation inspections.

To monitor the quality of potable water, a temporary water laboratory was set up in a generator-powered conference room. Lab technicians conducted chlorine residual tests and bacteriological analyses on water from buffaloes and, when water pressure returned, on samples taken from several locations throughout the water distribution system. Ice samples were also tested for contamination when food service facilities resumed operations. From 17 June to 1 July, 362 water tests were conducted, revealing



contamination in 2 buffaloes and low levels of chlorine in the distribution system. As a result, the buffaloes were quickly disinfected and the distribution system's chlorine level was raised.

Recognizing the increased risk of water and food-borne diarrheal illness, personnel investigated acute gastroenteritis (AGE) cases and plotted their findings on a graph in which they compared the incidence of AGE before and after the eruption in order to detect emerging outbreaks. From 17 June to 9 July, 349 cases of AGE were investigated and tabulated. Graphs

showed that despite unfavorable conditions that followed the eruption, food and sanitation controls were effective in preventing an AGE outbreak. In addition, continuous surveillance of subsistence reduced the potential for food-borne illness outbreaks.

To determine if respiratory problems increased as a result of volcanic ash, all respiratory complaints were investigated and plotted on a graph in which incidence of such complaints during the month prior to the eruption were compared. The analysis showed



no increase in respiratory complaints associated with ash.

To determine the potential health risks from exposure to airborne volcanic ash, the Industrial Hygiene Department collected and analyzed 103 filtered air samples between 12 June and 9 July. Samples were also sent to Hawaii and to an OSHA lab in Utah for further analysis. The results and interpretation of these analyses provided critical information to COMUSNAVPHIL and CINCPACFLT.

Shortly after the eruption, personnel from the Entomology Department and the Public Works Center formed a pest control unit and conducted mosquito and fly control operations that reduced fly and mosquito breeding. In addition, Entomology Department personnel intensified mosquito surveillance throughout the U.S. facility to assess the potential for mosquito-borne diseases.

With little rest or relief, emergency room staff worked persistently through the height of the eruption, treating persons injured by collapsing buildings, falling tree limbs, and blowing ash. During the period of 15 to 18 June, 240 patients received treatment in the emergency room, more than double the usual patient load. Eight major surgical procedures were performed in an atmosphere in which

operating room temperatures reached 89° with 90 percent humidity, surgical linen was scant, and there were no steam or ethylene oxide sterilizing capabilities. One hundred and twenty-five patients, of which 19 had multiple trauma, also received 532 radiographic examinations in which portable X-ray machines and an improvised system of manually processing and drying film were used.

On 17 June, families started the evacuation process by Navy ships to Cebu. To ensure the safety of the evacuees, which included 55 pregnant women, USNH Subic Bay and 13th AFRMC staff accompanied patients on evacuation ships. Among the accompanying staff were OB/GYN, family practice, and anesthesia providers as well as critical care and obstetric nurses. Consequently, evacuation ships were equipped and supplied based on demographics of the evacuees, and crewmembers were briefed on the management of evacuees. By 22 June, all inpatients and maternity patients had been evacuated and by 24 June the hospital, with the exception of the Alcohol Rehabilitation Department, was considered fully operational.

Reaching Out to the Community

While numerous staff members walked for nearly 6 miles along ash-laden and debris-filled roads to their duty stations, others on authorized liberty emerged themselves in search and rescue operations in the local civilian community and in on-base housing areas. For instance, a staff member, who was in the Kalayaan housing area, splinted the fractured arm of a marine during the eruption. Then, when Marmont Hotel collapsed, two hospital corpsmen assisted in the evacuation and care of nearly 150 Air Force personnel that had been housed within the hotel. They established a first aid station, fabricating dressings from torn sheets, splints from furniture legs, and disinfecting irrigation fluids through boiling; they treated 18 casualties suffering from abrasions, lacerations, eye

injuries, and fractures. On 16 June, another staff member surveyed 24 households in his neighborhood for injury, illness, and damage. By establishing a "runner" system with the nearest Facility Security Department post that had radio communications, he was able to obtain medication for two children and to inform the hospital on the status of two third trimester obstetric patients.

Despite risk posed by continuing volcanic activity and mudflows, USNH Subic Bay staff also assisted in treating 1,371 indigent Filipinos and displaced Aeta tribesmen during Medical Civic Action Programs in Pastulan Village, Bataan; Cabangan, Zambales; the Green Beach training area; and Castillejos. In addition, 1,182 indigent Filipinos were treated in Dinalupihan, Bataan. USNH Subic Bay also donated 120 units of blood to the Philippine National Red Cross and loaned an infant incubator to the nearly destroyed Olongapo General Hospital. Working parties from the Occupational Health/Preventive Medicine Directorate helped to clean up debris at the Olongapo Social Hygiene Clinic and erected three GP-Medium tents that enabled the clinic to resume operation of its Sexually Transmitted Disease Control Program.

The total casualty count associated with Mt. Pinatubo's eruption included 3 fatalities, 12 major injuries, and 216 minor injuries. The Surgeon General once said, "We train and are prepared for combat, and when it comes we generally enter the environment knowingly. Not so with natural disasters. They come unexpectedly and often are devastating to people and property." Although unexpected, the leaders and staff of USNH Subic Bay kept with the Navy tradition of providing the highest quality health care possible in the face of severe disaster. By doing so, they have brought USNH Subic Bay back to "CHARLIE GOLF ONE." □

Story by CAPT G.L. Navarro, MC, Commanding Officer, USNH Subic Bay, and LT V.M. Castillo, MSC, Public Affairs Officer at the same facility.

Alcoholism Recovery Program Success

CAPT Douglas M. Grodin, MC, USN

At least 10,000 new cases of alcoholism are treated annually in military hospitals and military residential treatment programs, making the Department of Defense (DOD) a major provider of inpatient alcoholism treatment and one of the largest occupational alcoholism programs. With 22 Navy hospital-based alcohol rehabilitation departments and 4 freestanding alcohol rehabilitation centers, the largest proportion of DOD's treatment capability resides in Navy programs.

Inpatient alcoholism treatment programs are sometimes asked to quote their "success rate." This is not as straightforward a matter as it might at first seem to be. There is no single best response, although an overall treatment effectiveness rate might be cited. In fact, there are a variety of measures and definitions of "success," and there are distinct subpopulations whose outcomes differ significantly.

In order to determine outcome rates, a research study was conducted at the Tri-Service Alcoholism Recovery Department (TRISARD),* National Naval Medical Center, Bethesda, MD, by clinical staff members in collaboration with consultants from the Department of Occupational Medicine, Johns Hopkins University. This article, summarizing some of the published results (1) of that research, will briefly outline the study method, describe the inpatient treatment program and aftercare

requirements, define outcome measures designed to gauge "success," and discuss findings and their practical implications. Conclusions can be generalized to other military 6-week inpatient treatment programs.

The Study

The study goals were: (1) to ascertain what patient characteristics correlated with successful inpatient program completion, (2) to identify specific predictors of long-term successful outcome, and (3) to determine the significance of compliance with aftercare (continuing care) program requirements.

Through fiscal years 1985-1987, patients admitted to TRISARD were observed in the inpatient treatment setting and were subsequently studied for up to 2 years following discharge from the hospital. The study group consisted of all consecutively admitted patients with a DSMIII diagnosis of alcoholism who returned to active duty following inpatient treatment for alcoholism, and included patients who successfully completed the inpatient program as well as all patients who were discharged as inpatient treatment failures, discharged early, or who refused treatment.

Followup was accomplished using a 25-item forced-choice treatment effectiveness questionnaire sent to commanding officers which requested information from cognizant military, medical, and rehabilitative supervisors of the former inpatients. It was also requested that the former inpatients be interviewed, and that this material be

*See also "Tri-SARF: A Unique Facility Returns Patients to Duty," *U.S. Navy Medicine*, Volume 72, May and June 1981.

included in the narrative section of the followup questionnaire. These questionnaires were mailed to commands at 3, 6, 12, 18, and 24 months posthospitalization. If there was no response to the first inquiry, another questionnaire was sent, followed by a telephone call to the unit commander. If the servicemember had been transferred to another command, the process was repeated using information obtained from the worldwide military locator services. In all, followup data was collected on 722 servicemembers whose posthospitalization courses were tracked.

Treatment Program

TRISARD was founded in 1979 by the Surgeons General of the Navy, Army, and Air Force to establish a common treatment model. The 6-week inpatient program is an abstinence-based, highly structured, multidisciplinary, multimodality program accredited by the Joint Commission on Accreditation of Health Care Organizations. Detoxification, when indicated, is accomplished before admission to the TRISARD program.

Once admitted, each patient undergoes a preliminary period of multidimensional assessment by a physician, ward nurse, psychiatrist, alcoholism treatment counselor, occupational therapist, and family systems specialist. An individualized treatment care plan is developed based upon selected problems and concerns identified by the multidisciplinary team members. Patients who are able to take disulfiram (Antabuse) are encouraged to do so; approximately 80 percent of the patients receive supervised administration of disulfiram during hospitalization.

Treatment in this therapeutic community consists of daily involvement in small group therapy, special issue treatment groups, didactic presentations, required readings, maintenance of a feelings journal, preparation of a focused autobiography, attendance at Alcoholics Anonymous (AA) meetings, life skills management sessions, occupational therapy, physical conditioning, dietary modification (if indicated), planned recreational experiences, and individual medical care, counseling, and psychological attention. A concurrent 40-hour family program includes didactic presentations, conjoint counseling, group therapy, and participation in Al-Anon meetings.

All patients undergo formal discharge planning and a relapse prevention program before completing the inpatient program. They are then discharged to an additional year of continuous aftercare as required by military regulations. The aftercare (continuing care) program is provided by counseling personnel at the different military facilities

and bases to which patients return, and at a minimum usually consists of 12 months of weekly therapy sessions, short-term continuation of Antabuse, regular attendance at AA meetings, and ongoing observation by command representatives.

Outcome Measures

Successful inpatient treatment completion required that the patient comply fully with all program regulations, fulfill all treatment assignments, actively participate in the therapeutic community, pass a multidisciplinary midtreatment review, prepare an individualized 12-month aftercare plan, and be rated by the treatment staff as having satisfactorily complied with treatment. Patients who successfully completed the inpatient program are referred to as program graduates.

Following discharge from the hospital (as either a program graduate or nongraduate) a patient's course was defined utilizing five outcome measures:

(1) A patient was considered to have been *abstinent* from alcohol if there had been no reports of any drinking at any time since inpatient treatment.

(2) The patient was considered to have had *no alcohol related events* if there were no reports of any occupational, administrative, or legal infractions associated with alcohol use.

(3) A patient was considered *compliant with aftercare* as long as he or she was reported to be participating in the required therapy sessions, attending AA meetings, and adhering to Antabuse instructions (if applicable).

(4) The patient was considered to have been an *occupational success* as long as he or she was considered a treatment success by the unit commander, recommended for promotion when due, and had no adverse occupational, social, or legal events regardless of alcohol-relatedness.

(5) The patient was considered to have been a *clinical success* if the treating professional rated the patient as either abstinent and compliant or, if an episode of drinking had occurred, as long as the patient was taking appropriate action to prevent further relapse.

Cumulative long-term outcome was considered to have been *totally successful* if all reports from all sources were unequivocally positive. Patients who had been discharged early from the inpatient treatment program could still have a totally successful cumulative long-term outcome, because failure to complete the inpatient program was analyzed separately from subsequent performance at the receiving command.

TABLE 1
Predictors of Successful Completion
of Inpatient Treatment

Status	Percentage Successfully Completing TRISARD Inpatient Program
Rank	($P < .0001$)
Trainees, unskilled workers (E1-E3)	66
Skilled workers (E4-E6)	82
Supervisors, technical staff (E7-E9)	92
Management, executives (officers)	90
Length of Service, year	($P < .0032$)
0-3	75
4-7	84
8-11	86
12+	88
Age, year	($P < .0003$)
15-19	48
20-24	77
25-29	82
30-34	83
35+	91
MAST Score	($P < .0001$)
0-4	52
5-9	73
10-19	76
20-29	87
30+	90

Inpatient Program Completion

Findings. Overall, 81 percent of the entire patient population completed the program. Rank, age, length of service, and admission Michigan Alcoholism Screening Test (MAST) scores were positively associated with successful completion of the inpatient program (Table 1). Older, higher ranking members with more years of service had a substantial likelihood of successful completion. Only 66 percent of E1-E3 members were able to complete the inpatient program, whereas 90 percent of senior enlisted and officers were able to do so.

MAST scores are useful as an indicator of the patient's perception of the severity of their alcohol problem. The higher (more severe) the MAST scores in this patient population, the higher was the likelihood of successful completion.

Notably, among the other variable studies, neither prior treatment for alcoholism nor positive family history of alcoholism was significantly associated with successful completion.

Discussion. There is definite jeopardy to career viability which accompanies failing an inpatient treatment program. Junior servicemembers may have less investment in the military as a career, and may be less vulnerable to the pressures which may be compelling some of their senior counterparts to come to grips with their alcoholism. Additionally, younger patients may have suffered less dramatic physical, interpersonal, and psychological consequences of their alcoholism. As a result they may be less convinced about the need for deep personal investment in a recovery program which demands self-sacrifice, reordering priorities, and sweeping restructuring of lifestyle.

Long-Term Outcome

Findings. Through 2 years of followup, 77 percent of program graduates were rated as being *totally successful* in

TABLE 2
Life Table Estimates of the Probability of Successful Rehabilitation at 2 Years as
Predicted by Rank and Successful Completion of Inpatient Rehabilitation

Status	Probability of Successful 2-Year Outcome Among Inpatient Program Graduates	Probability of Successful 2-Year Outcome Among Patients Who Do Not Satisfactorily Complete Inpatient Treatment
Trainees, unskilled workers (E1-E3)	.68	.50
Skilled workers (E4-E6)	.76	.68
Supervisors, technical staff (E7-E9)	.80	*
Managers, executives (officers)	.85	.78

*Group was too small for a reliable estimate.

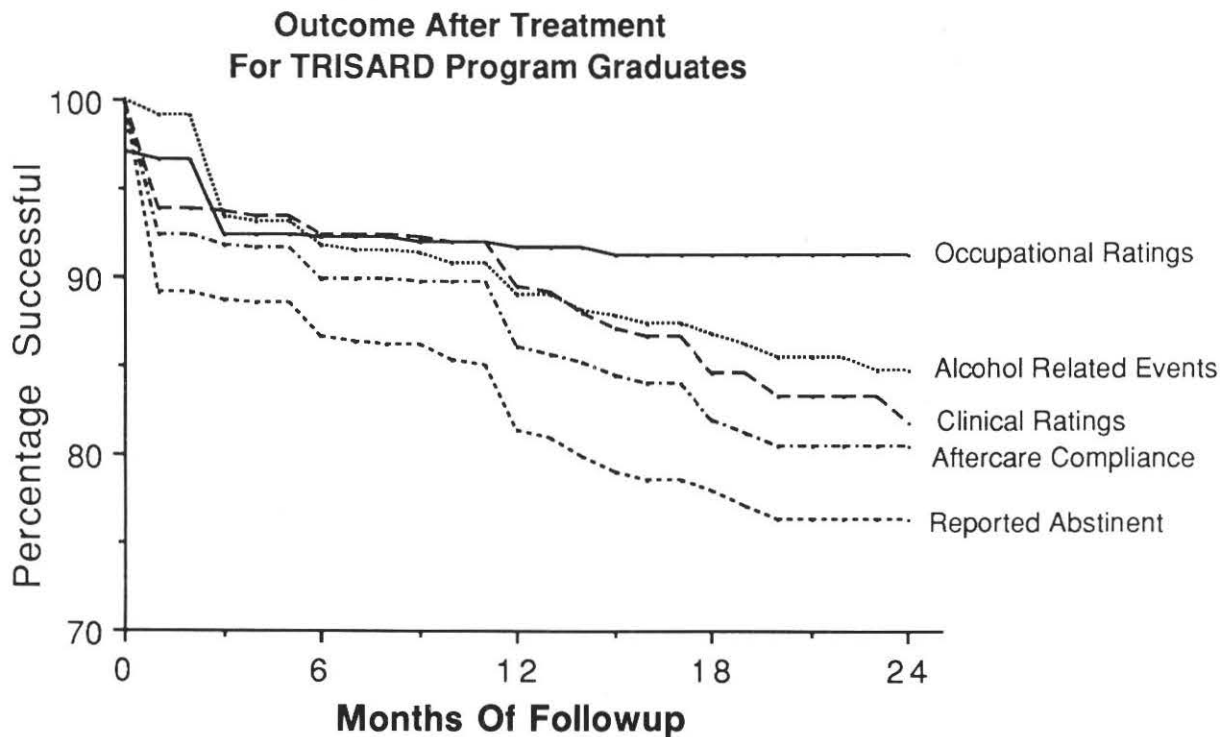


Figure 1. Survival function of TRISARD program graduates rated as still successful for each outcome for various lengths of followup after inpatient program completion.

all reports for all outcome measures, as contrasted with 63 percent of those who did not successfully complete inpatient treatment, a clinically and statistically significant difference. It was noteworthy that more than 90 percent of program graduates were rated as being *occupational successes* by their commands through the followup period (Figure 1). Rank and successful inpatient program completion were highly predictive of long-term treatment outcome (Table 2).

Uninterrupted abstinence from alcohol was the most stringent outcome measure studied. The relationship between rank and abstinence is depicted in Figure 2, and the relationship is seen to be strong, orderly, and significant. The recovery rate is clearly highest in the officer and senior enlisted ranks, and falls off remarkably as the enlisted ranks are descended. The third predictor variable which demonstrated a powerful effect on outcome was compliance with aftercare (vide infra).

Other variables including the severity of the alcohol problem as indicated by MAST scores (which had been predictive of inpatient program completion), family history of alcoholism, and prior alcoholism treatment were not significantly related to long-term recovery.

Discussion. The long-term recovery rates in this as with other military programs are among the most favorable in the alcoholism treatment effectiveness literature, and are similar to the reported outcomes in civilian pilots, physi-

cians, and other occupationally select groups. Many servicemembers in the study population chose to accept treatment rather than risk possible separation from the service or experience another major negative contingency.

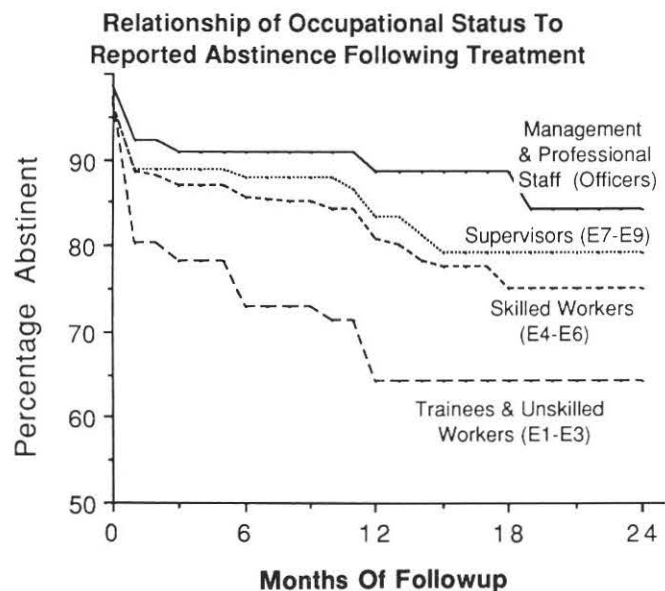


Figure 2. Survival function for TRISARD program graduates rated as completely and continuously abstinent from alcohol by all reports when stratified by rank and followed for up to 24 months after inpatient program completion.

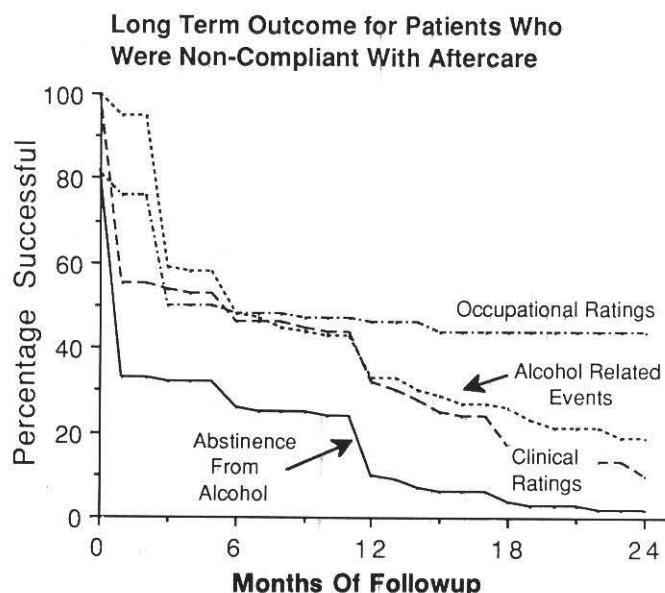


Figure 3. Clinical and occupational outcome over the 24-month followup period for patients who were rated as not complying with the recommended 12-month aftercare plan by the professional in charge of aftercare.

Such a group has an inherently better prognosis than the general population.

Successful inpatient program completion substantially increased the reliability of returning servicemembers. Twenty-three percent of program graduates relapsed as contrasted with 37 percent of nongraduates.

The explanation for the strong relationship between rank and outcome is related to socioeconomic status, and higher long-term treatment effectiveness rates for older alcoholic patients may also reflect both the patient's commitment to military service as a career and the military's commitment to the patient's recovery.

As discussed previously, the attrition rate from the inpatient program for junior enlisted personnel is high, and this group of nongraduates demonstrates only 50 percent uninterrupted abstinence. Of those junior enlisted personnel who do successfully graduate from the inpatient program, the recovery rate is 68 percent at 2 years posthospitalization, a rate which is still far below that of older and more senior members. This suggests that there exists at least two distinct subpopulations with demonstrably different outcomes and presumably different needs. This raises the specter of the advisability of perpetuating one-size-fits-all treatment programs. It may be prudent for the military to design a selection of treatment program options which are tailored to meet the clinical needs of specific identifiable patient populations.

Compliance With Aftercare

Findings. The outlook for uninterrupted abstinence in individuals who do not comply with aftercare is dismal. Of the 95 individuals in the study group who did not comply

with the recommended aftercare plan, the *total success* rate was a meager 2 percent (Figure 3).

Contrariwise, the positive effect of rigorous compliance with aftercare on long-term outcome was equally dramatic. Of the 722 patients, 502 (70 percent) had *successfully completed* inpatient treatment and had been continuously compliant with planned aftercare. Of these patients, 97 percent had been *totally successful* by all measures at the time of followup.

Discussion. It is predictable with considerable certainty that patients who do not adhere to aftercare program requirements will relapse.

Strict compliance with aftercare requirements is a most powerful factor associated with good outcome. The findings indicate that if a patient successfully completes inpatient treatment and thoroughly complies with the 1-year aftercare requirement, there is a very high likelihood that the patient will continue on to be *totally successful* at the 2-year mark.

It is clear that compliance with aftercare and inpatient program completion are two main indicators of reliability for members returned to duty following inpatient treatment. This information can be factored into deliberations when considering granting or restoring duties or privileges in any of the many DOD security clearance and personnel reliability programs. Additionally, a command can enhance the recovery rates of its members by supporting, monitoring, and insisting upon compliance with aftercare program requirements.

Summary

Analysis of recovery rates in program graduates demonstrated that 77 percent had been *totally successful* in all reports for all outcome measures through 2 years of followup. Significantly, 90 percent of program graduates were *occupational successes* through the followup period.

There was a strong statistical association between successful inpatient program completion and the variables of rank, age, and high MAST score. Strong predictors of favorable long-term outcome included rank, successful inpatient program completion, and compliance with continuing care (aftercare) recommendations.

It cannot be overemphasized to health care providers and military commanders that long-term outcome can be predicted by the degree of patient compliance with aftercare requirements. Aftercare efforts should be vigorously encouraged and supported.

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Quest for Quality:

Past and Present

LCDR Joyce Seidman, MSC, USN
CAPT Kenneth Gibson, MSC, USN

The United States emerged from World War II as the strongest, most productive nation the world had ever known, producing goods for which there was unparalleled demand and no significant competition. During this period of prosperity, postwar America enjoyed dominance in world markets and consumer demand seemed insatiable. Quality took a backseat to production—getting the numbers out—and as market share increased, productivity goals were met at the expense of quality. Quality of American-made goods was an afterthought.

In contrast, Japan after World War II was a devastated country with no natural resources, a crippled industrial base, and a stagnant economy. Its per capita income was about \$200 U.S. dollars compared with a per capita income of \$8,000 in the United States.(1)

Japan correctly perceived itself to be in a state of crisis. Radical changes needed to be made before Japan could even contemplate competing successfully in the postwar global economy. With remarkable determination and a clear vision, Japan set out, ironically with the help of American experts, to make fundamental and lasting changes in its economic infrastructure.

Time Is Not on Our Side

Survival is a profound motivator; crisis, a powerful catalyst. The perception of "having nothing left to lose" greatly enhances the receptivity of organizations, governments, and industries to different ways of doing business and to the potential of innovation. The Japanese were more than ready to make the commitment to transformation after World War II. They were eager to rid themselves

of a beggar-state mentality that was choking the country's very lifeblood. They were poised to *absorb*, not merely receive, the teachings and advice of American productivity experts like Dr. W. Edwards Deming.

It is ironic that as postwar America continued to rely on mass production and outdated management methods to maintain its global dominance, American experts were instrumental in ensuring Japanese success. American industry, once the most dominant in the world, found itself struggling to regain markets and international status. American businesses were, with regularity, forcing on their customers products of lower quality than they were capable of making.(2)

While America was sleepwalking through the modern quality era, a global economy and international competition for consumer goods and services were evolving. Product and service *quality* were becoming the competitive edge. In this environment the United States could not count on its history of success to guarantee its future.

Early Attempts to Ensure a Quality Infrastructure

Quality is not a new concept, yet only recently has quality emerged as a management function integrated into organizational strategic planning. Quality is a slippery concept, easier to visualize than to define. Japan learned that quality is not accidental: it must be planned for. Quality transformation requires a sense of urgency, leadership, and a dedication to the improvement process. It too cannot be left to chance.

In the United States, the earliest attempt to ensure quality was the European "craftsmanship" concept, in which

workers learned a skilled trade through years of arduous apprenticeship. Master craftsmen were responsible for ensuring that the small volume of products made was of high quality (after all, their reputations were on the line, too) and that the products met the needs of customers.

Unfortunately, this concept soon became incompatible with the rapid expansion of the American economy and its requirement for an expanded labor force to meet an increasing demand for products. The early 1900's were peak immigration years, and the American work force swelled to accommodate huge numbers of motivated and well-intentioned immigrants who lacked skills and education, but who could nevertheless be employed in manufacturing and other industrial settings.

Responding to this unique set of circumstances, Frederick W. Taylor developed a management system that would have long-lasting effects on quality, productivity, the workplace environment, and American management. His scientific management theory separated the planning and execution aspects of work—a dichotomy viewed as artificial today. In this system, a few trained specialists planned how work would be accomplished and semiskilled or unskilled workers then carried out the plan.(3)

The Taylor system increased productivity without requiring more skilled workers, but it had devastating effects on quality and ambiance of the workplace. Quality developed as reactive and inspection-oriented, an assigned task delegated to an inspector or an inspection department responsible for ensuring that products conformed to specifications. The focus was to "inspect in" quality by identifying defects at the end of a process and sending those defective products back for rework.

While this is one way to achieve quality, it is extremely costly in terms of rework, waste, and needless administrative complexity. Yet, the inspection approach to quality was entirely consistent with the prevailing scientific management system at the time—a cumbersome rules and regulations-bound, top-heavy management structure in which little discretion was left to workers and supervisors.

By the late 1940's industrial quality control methods were evolving, consisting of the application of statistical techniques to an ongoing production process. W.A. Shewhart at Bell Telephone Laboratories made the deceptively simple observations that even the same part produced by a single operator on a single machine was likely to show some variation over time, and that this variation was a fact of industrial life that could be understood using basic statistical tools such as run charts, control charts, cause and effect diagrams, and pareto charts.(4)

From a management viewpoint, this required rethinking the problem of quality. The issue was no longer the existence of variation, but how to distinguish acceptable variation from fluctuations that suggested problems.(5) Shewhart defined the limits of random variation in any aspect of a worker's task, setting acceptable upper and lower limits, so that any points outside the limits could be

detected and studied. Shewhart's genius was in recognizing when to intervene and when to leave a process alone. He further suggested workers could be trained to understand the variability of processes and use statistical tools to make adjustments and improve processes on their own, without managerial prompting. This is consistent with the scientific approach to quality, which views employees as contributory to one or more processes. In this approach, every employee receives work from others, adds value to that work, and supplies it to the next person in the process. Thus, the worker represents customer, processor, and supplier all in one.

Principles of Continuous Improvement

Shewhart's statistical approach to quality was further refined by Joseph E. Juran and Deming to assist the Japanese in improving their manufacturing processes after World War II. In 1947, Deming was recruited by General Douglas MacArthur to help with the 1951 Japanese census. Deming, a distinguished American statistician and quality/productivity expert, had implemented statistical quality control concepts successfully in various government and private-sector projects in the United States.

Deming became deeply involved with the postwar plight of the Japanese economy and worked tirelessly with the Union of Japanese Scientists and Engineers (JUSE) to assist the nation's recovery effort. In March 1950, JUSE invited Deming to lecture to 500 Japanese research workers, plant managers, and engineers on quality control methods.(6) Deming urged managers to focus on variability and its causes. He encouraged the Japanese to adopt a systematic approach which became the Plan, Do, Check, Act (PDCA) cycle. He pushed top managers to become actively involved in quality improvement.

Deming also realized that he needed to educate the hands-on workers or enthusiasm for statistical techniques would wane in Japan as it had in the United States. Deming lectured extensively to Japanese operational managers and frontline workers. He told them they could capture markets the world over within 5 years. And he told the Japanese how they would capture those markets. Only 4 years later, customers all over the world were demanding Japanese products.

Today, Deming is credited by most authorities with the successful rebirth of Japanese industry and the quality revolution. To show their recognition of and appreciation for his contributions, the Japanese established the Deming Prize in 1951, a prestigious, sought-after award of international renown, given to individuals and companies for superior accomplishments in quality and productivity.

What Deming Taught the Japanese

For industries, including health care, to be competitive, the issue becomes how to capitalize on, rather than resist, transformation to a total quality management (TQM) culture. The culture of risk-averse organizations must change

to reward innovation and risk taking. Leaders must generate excitement for change, communicate their vision, and inspire employees with their vision of future possibilities. Leaders implementing TQM should be courageous enough to be willing to sacrifice short-term gain for long-term investment, e.g., by investing in the potential of personnel through education and training; by investing time, dedication, and money in the cultural change; and by viewing possible decreases in short-term profits and productivity as an investment rather than a cost.

TQM seeks to organize the company in a new way so that *everyone at all levels* plays an active role in understanding the key processes that comprise a system, collecting and analyzing data on these processes, generating and testing hypotheses about the causes of defects, and designing and implementing proposed solutions that are the result of data analysis, not guesswork. This is diametrically opposed to the old paradigm of unveiling the *fact* of flaw, not its cause, and assigning blame, rather than recognizing that it is the process which is flawed and needs improvement.

The old workplace paradigm was characterized by authoritarian management and organizational control from the top to achieve results. Employee performance was often judged by numerical goals. A system driven by numbers inevitably focuses on short-term results, which gives rise to internal turf battles, fudging the numbers, and an inward focus on the product rather than the process. The control-oriented paradigm further assumes that people require close supervision and tightly enforced regulations to perform their jobs.

The new approach of total involvement relies on fostering employees' commitment: people can do their jobs best if they have reliable information and data, solid and ongoing training and tools, and an open, two-way communication flow that keeps them informed about progress and any changes in organizational direction. People are viewed as assets, respected for their knowledge and the contributions they can make to the future of an organization. Decision making is decentralized to encourage maximum employee participation in the decision-making process. Nowhere is it "chiseled in stone" that management thinks best!

One quality improvement activity shown to have profound effects on the workplace is the use of interdepartmental teams to improve processes that cut across traditional departmental boundaries and functional lines of communication and authority.⁽⁷⁾ Understanding a process requires that people from different hierarchical levels *think together*—people who, without benefit of a team structure, might never interact with each other. Diverse perspectives and expertise are brought together to focus on complex issues because no one person occupies a perch from which the whole process is visible, yet it is that very process that is the focus of change, and not the product or the individual. A related benefit of teams is that a

process owner is identified who can serve as the organizational eyes and ears of the whole process *as it is experienced by the customer*.

A fundamental assumption of TQM is that every process can be improved. By focusing on the process, continuous small, incremental improvements can be achieved, reducing costs and the need for rework. By building quality into a process, quality becomes a *shared responsibility* of all employees.

While Deming stressed that *reducing process variation* is a key element of TQM, he also stressed that quality is not achieved by statistical application alone. Deming's philosophy extends far beyond mere statistics. Deming has outlined his method for achieving quality and productivity in his 14 points for management (see box). Embracing the 14 points is vital if management is to change its thinking and behavior.

Japan Can . . . Can We?

Although Deming was revered in Japan, it wasn't until 1980 that Deming became nationally known in the United States, when he was featured on an NBC White Paper called "If Japan Can . . . Why can't We?" In this broadcast, Deming shared how his system of continuous improvement based on statistical methods, resulted in increased productivity and helped transform the Japanese economy after World War II. Deming was thus officially "discovered" by leaders of American companies who immediately enlisted his assistance in developing comprehensive quality management programs. Precariously positioned companies such as Westinghouse, Corning, Motorola, Ford, and Nashua, all of which perceived themselves to be in a state of crisis, implemented Deming's practical advice with spectacular results. The successes of these pioneering companies are now being duplicated by companies from all sectors of the industrial landscape.

Although this country came late to the quality movement, many companies in the United States have now adopted systematic programs of quality management. In 1989, for the first time, an American company, Florida Power and Light, won the coveted Deming Award.

Today there is fierce competition for the American equivalent, the Malcolm Baldrige National Quality Award. The Baldrige Award, established by legislation in 1987, honors American firms leading the way in TQM and customer satisfaction. Awarded annually, the Baldrige Award is the result of a national competition based on a rigorous application process and tough standards. It has become recognized as the keystone of quality efforts in the United States. Motorola, a Baldrige Award winner, is not only generating record profits as a result of its quality transformation but is today the world leader in cellular telephone manufacturing and is rapidly approaching its corporate goal of quality defect levels of 3.4 parts per million, *performance unimaginable* only a few years ago.⁽⁸⁾

Quality in Health Care: The National Demonstration Project

Increasing competition for market share among overbuilt and underused hospitals has transformed the U.S. health care system into a major industry. Competitive forces have become so keen that key health care providers—physicians and hospitals—now compete aggressively for the same customers. The health care industry is

Deming's 14 Points*

1. **Create constancy of purpose for improvement of products and services.** A long-term strategy aimed at rewarding innovation, research, and consistent improvement must be developed.

2. **Adopt the new philosophy.** Continuous improvement of every process, product, or service is the goal!

3. **Cease dependence on mass inspection.** Quality comes not from inspection but from improvement in the process.

4. **End the practice of awarding business on price tag alone.** Relationships with customers should emphasize long-term benefits of partnership, not merely price.

5. **Improve consistently and forever the system of production and service.** It is the leader's job to continually identify and monitor opportunities for improvement.

6. **Institute training.** Quality improvement begins with training and ends with training.

7. **Institute leadership.** Leaders walk their talk for change to occur.

8. **Drive out fear.** Management must provide environment where employees can take risks, ask questions, and make mistakes.

9. **Break down barriers between staff areas.** Teamwork is vital to breaking down cross-functional boundaries.

10. **Eliminate slogan, exhortations, and targets for the work force.** All employees want to do a good job; exhorting them is insulting.

11. **Eliminate numerical quotas.** Reaching quotas often occurs at the expense of quality.

12. **Remove barriers to pride of workmanship.** Enable and empower employees to do their job. This is management's responsibility.

13. **Institute a vigorous program of education and training.** Educate all levels of the organization in the new way.

14. **Take action to accomplish the transformation.** The commitment and active involvement of top leadership is a must.

*Deming WE. *Out of the Crisis*. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study; 1982:23-24.

forced to find new and better ways to provide services and attract and retain customers.

The question must be asked: Can the tools of modern quality improvement, with which other industries have achieved breakthroughs in performance, help in health care as well?

This question is being addressed by the National Demonstration Project on Quality Improvement in Health Care (NDP). NDP is a collaborative effort of health care organizations and industrial quality management experts, among them highly respected systems such as the Harvard Community Health Plan, Johns Hopkins Health System, Kaiser-Permanente Medical Care Program, and the University of Michigan Hospitals. Launched in 1987, the project is investigating the applicability and effectiveness of industrial quality improvement methods in health care organizations. NDP is funded by the John A. Hartford Foundation and hosted by the Harvard Community Health Plan.

The participant health care organizations, assisted by their assigned quality expert, form teams to address a quality problem of their choosing locally, in their own real-world operations, through specific pilot projects. While a description of their experiences is beyond the scope of this article, preliminary results are promising. After about 8 months, the teams began reporting back simple, elegant stories of successful application of the basic tools essential for TQM to flourish. The experience of NDP participants suggests that quality improvement, far from being a diversion or somehow tangential to "the real business of health care," leads directly to greater efficiency and cost reduction.

Military Applications of Quality Management

With the excesses of the 1980's vividly publicized in media reports of government waste, contractor fraud, cost overruns, and other system abuses, it became apparent that the public sector needed to restore confidence among its internal and external customers and reduce system inefficiencies. Instituting quality management was determined to be the method through which positive improvement could be made.

The Department of the Navy started on its quest for quality in 1983. In 1990, ADM Frank Kelso, Chief of Naval Operations, suggested "total quality leadership (TQL)" be adopted as the terminology to describe the Department of the Navy's interpretation of Deming's philosophy and management practices. Today, the Navy is committed to implementing that quality leadership culture.

Navy Medical Department: TQL Pioneers

The quality ethic pervading a corporate culture extends far beyond the "business" of the organization—for Navy medicine, far beyond the direct patient care provided in our medical treatment facilities. It requires a long-term

commitment that drives the entire organization. Gone are the days when the quality crisis could be met by setting broad goals and delegating everything else to the rest of the organization. Without the personal leadership of upper managers and the total involvement of all personnel, there can be no solution to the quality crisis facing Navy medicine today.

The implementation of TQL is the Navy Surgeon General's number one priority. Under the leadership of VADM James A. Zimble, Navy medicine embarked on the quality journey during the summer of 1989. That year the Annual Surgeon General's Conference for Commanding Officers presented TQL as the future of Navy medicine.

Total involvement requires cultural, attitudinal, and behavioral changes at all levels of the organization. To help encourage these changes, training programs must be put in place to support and reinforce a customer-focused, total involvement quality culture.

The Naval Medical Quality Institute (NMQI), located at the Naval School of Health Sciences, Bethesda, MD, has been designated the research and education repository for TQL. In its first year, NMQI has developed and conducted training programs specifically tailored to target groups at several levels of the Navy Medical Department: TQL awareness training for command leadership, officer and enlisted personnel and civilians; and hands-on TQL workshops for command and upper management, department heads, and facilitators.

The Navy Medical Department will continue to experience significant manpower and monetary shortages over the next 10 years. Our current paradigms will be challenged or changed as we attempt to address systemwide issues. TQL may hold some badly needed solutions for American health care in general and Navy medicine in particular.

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LCDR Seidman was course coordinator and instructor at the Naval School of Health Sciences (NSHS) when this article was written. Selected for full-time outservice training, LCDR Seidman is currently studying in San Diego, CA. CAPT Gibson is Commanding Officer at NSHS and Director, Naval Medical Quality Institute, NSHS, Bethesda, MD 20889-5033.

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Dental Officer Symposium

The 31st Annual Naval Dental Officer Symposium and Luncheon will be held 16-17 Feb 1992 at the Guest Quarters Hotel, Chicago, IL.

The 1-day symposium is open to all active duty, Selected Reserve, and retired dental officers and will be held 16 Feb in conjunction with the Chicago Midwinter Dental Meeting, one of the largest civilian dental conferences in the nation. A luncheon will follow on 17 Feb.

Active duty and retired personnel interested in attending should contact: CDR Steve Wallace, DC, USN, Naval Dental Center, Great Lakes, IL 60088. Telephone: Defense Switched Network (previously Autovon) 792-2100 or Commercial (708) 688-2100.

Selected and retired Reserve personnel interested in attending should contact: CDR Mike Kaske, DC, USNR, 330 Main Street, Box 729, Twin Lakes, WI 53181. Telephone: (414) 279-5325 (home) or (414) 877-2161 (work).

Occupational Health Workshop

The Navy Environmental Health Center will sponsor the 33rd Navy Occupational Health and Preventive Medicine Workshop on 14-20 March 1992 in Virginia Beach, VA.

Occupational health and preventive medicine personnel are encouraged to attend this workshop. There is no registration fee.

The workshop has been approved for CME/CEU credits. Abstract submission forms can be requested from this command. Submissions must be received at the Navy Environmental Health Center by 15 Jan 1992.

For additional information contact: Dianne Best, Navy Environmental Health Center, 2510 Walmer Avenue, Norfolk, VA 23513-2617. Telephone: Autovon 564-7575, ext. 461 or Commercial (804) 444-7575, ext. 461.

A Surgeon General's Eyes and Ears

If it could be said that the Navy has a dean of combat surgeons, RADM Ben Eiseman, MC, USNR (Ret.), certainly deserves that title. During a Navy Reserve career that began during World War II and then spanned some 34 years, Dr. Eiseman probably saw, assisted, or operated on more combat casualties than any other surgeon in the U.S. armed forces. When he wasn't sprinting across the invasion beaches of Normandy or Okinawa with the Marines, he was serving as surgical chief at several leading hospitals, teaching surgery both here and abroad, and writing literally hundreds of articles and several books. When the U.S. commitment grew in Vietnam during the mid-1960's, Dr. Eiseman's almost legendary experience became a precious commodity. Surgeon General of the Navy, VADM Robert B. Brown [1965-1969] called then CAPT Eise-

man back to active duty to be his surgical consultant. As the Surgeon General's eyes and ears in Vietnam, Eiseman played a unique role.

Navy Medicine interviewed Dr. Eiseman at his Denver, CO, office in the summer of 1990. Just over 2 weeks after this interview was conducted, Iraq invaded Kuwait, and much of what Eiseman discussed in that interview took on special significance. During the Gulf War, the then 73-year-old surgeon again served as a consultant, this time to the U.S. Army hospitals in Germany and at several Army medical units in the continental United States.

Navy Medicine: How did you become Surgeon General Brown's eyes and ears in Vietnam during that war?

RADM Eiseman: I always had ready access to him because he knew I was interested in trauma and was a member of the National Research

Council Committee on Trauma and Shock. Bob also knew that I had spent some time in Southeast Asia going all the way back to 1950. I had been all over Thailand and Laos and had cared for casualties when the French were still there, as well as having been visiting professor at medical schools in Thailand. So when the Vietnam war began to heat up, Bob and I would see each other quite frequently. I was a captain in the Reserves and suggested a closer liaison between the Navy and the large number of reservists that were being called up and sent over to Vietnam.

Indeed, at the time I was professor and chairman of the Department of Surgery at the University of Kentucky, I used to rotate my residents through the Marine Corps and the Navy. One time during the Vietnam war I counted 15 of my residents who were active reservists. It was therefore natural that he asked me to be surgical consultant to the Navy and Marine Corps. I was delighted to do it.

I had known the surgical consultants in Korea as well as those in World War II, such as Dr. Edward D. Churchill, who had been my boss at Harvard and had become the surgical consultant in the Mediterranean theater when I was a very junior medical officer with the amphibious forces. I went to Boston and talked with Dr. Churchill and asked him for advice.

What kind of advice did he give you?

He said the best thing to do was to get as open-ended orders as possible from the Surgeon General and then to go as far forward as possible, find the most junior medical officer around, and then just listen to him. Each time I went to Vietnam that's exactly what I did. The Surgeon General gave me carte blanche. He had me write my own orders and let me go where I

wanted. I took every opportunity to spend a day or two working in the field with the Marines.

What makes a good surgical consultant?

You first must know something about the military. Marines speak a different language than ordinary folks. Only by knowing the military can you get anything done. Most importantly, in a forward unit you must know how to minimize chances of getting injured or killed. You can't just take a good trauma doctor or a good infectious disease doctor and throw him into a combat zone and call him a consultant. He must be an active surgeon. If he takes his turn operating, then young doctors will listen.

He also must have clinical and academic credibility because often the frontline guys are reservists. They have come from a highly academic background where they've had a keen interest in learning. They inevitably look at regular medical officers, right or wrong, as a cut below their teachers at home. If you can approach them as one of their teachers and with a little bit of rank, that equates with more authority.

In Vietnam I would continually go out—get a chopper ride—to a battalion and hunt up the one or two medical officers in that battalion. I would simply ask them what was going on. "What have you learned? What can we do differently?" Academic surgeons are trained to ask questions and perhaps are particularly suited for the consultant's job.

It must have been a tremendous morale booster when you came and showed that someone cared about what they were doing.

I know it was. It made them think they weren't forgotten. They knew I

was the Surgeon General's representative, and what they told me would get back to the boss. Naturally, I also worked with the theater and division surgeons.

An additional role for the consultant is to help medical officers in forward areas put their frustrations, disappointments, and fears in perspective. This, of course, requires that the consultant himself has been through a war or two in a junior role—and is empathetic.

There are many frustrations for combat surgeons including such items as large numbers of wounded requiring short periods of contact in contrast to the more leisurely technique available in civilian practice. There is the inevitable need to evacuate a casualty toward the rear rather than providing total, definitive care. The doctor must do without some of the technical niceties he has become accustomed to in civilian practice.

In the military setting, the lack of equipment or supplies is a favorite outlet for frustration when things go wrong. A surgeon may miss a special instrument upon which he relied, or a diagnostic modality such as a CT scan, or monitoring equipment of some new and sophisticated design. Lack of such technical help is a favorite whipping horse when things go bad. A good consultant can point out to the frustrated surgeon the small incremental benefit of such devices, showing that the ultimate outcome of even severe injuries seldom depends on such items.

What is the surgical consultant's role in stimulating research and innovation?

The most important part of a successful research project is asking the right questions. A productive wartime consultant in a combat zone is one who has been trained to recognize the

unusual and to ask the proper scientific and clinical questions of the unusual clinical environment that constitutes combat casualty care. The consultant should be accustomed to inquiry. It is a state of mind that, at best, is associated with a clinician who has selected an academic career. He should also be accustomed to the routines of combat casualty care so he can recognize the unusual. A neophyte is for some time overwhelmed by the sheer mass (and terror) of caring for dozens or hundreds of casualties a day.

U.S. military history bears out this thesis. Weir Mitchell was a consultant in the Civil War when he pioneered his studies on causalgia. Cannon's seminal work on shock and Evarts Graham's work on empyema in World War I were performed during their duty as consultants. In World War II it was Churchill, Burford, and Sampson who, as uniformed consultants, discovered the benefits of operation for clotted hemothorax. In our own time, the advances in frozen blood in Vietnam, or adult respiratory distress syndrome, or multiple organ failure were all made by academicians either in or out of uniform acting as consultants.

How do you account for the enormous advances made in wartime medicine?

In fact, almost none of these advances were actually made during war. They were applications of discoveries made in between wars to the large numbers of casualties and the unusual conditions of a combat situation. Take penicillin as an example. Sulfanilamide was discovered before World War II. The enormous demand for its use sponsored advances in mass manufacturing, but the discovery preceded the war.

Indeed, the wise consultant in any future war should survey recent



CAPT Eiseman (center) and CAPT John H. Stover, MC, (right) pose with the 3rd Battalion, 4th Marines battalion surgeon at 3/4 Battalion Aid Station, Quang Tri Province, South Vietnam, October 1968.

advances in every branch of clinical medicine, and then be alert where and how such advances can be applied in a combat theater. I did this consciously before I first took up my duties in Vietnam.

Can you give an example of how this worked?

I can give you two, one clinical and the other more experimental. On one occasion I was riding in a truck convoy in the I Corps area in Vietnam toward a forward area where a fire fight was in progress. The truck in front of ours hit a buried mine and the marine in the front seat suffered a dislocated knee. We took him to Charley Med outside Danang, reduced the dislocation, but then identified an absent pulse. We performed a femoral arteriogram using a simple needle stick and a one-shot dye injection into the femoral artery. There was a block at the popliteal space which we repaired operatively. This was the first time such a technique had been used in the I Corps, and perhaps in the Vietnam theater, even though it was a reasonably well known procedure by that time in civilian practice. It was innovative in the military sense but certainly not in a scientific sense.

A more complex example might be the then puzzling observations of pulmonary edema that occurred following severe injury and resuscitation in Vietnam. In retrospect, it seems obvious that what we observed was simply adult respiratory distress syndrome. As with most problems, however, it was far from easy at the time. It took both clinical and laboratory research carried out by many of us to get the answer to what was then called "Danang Lung."

You have been associated with the military in several wars and in various capacities. As you review your experience, do you have any suggestions to

those who may face combat zone medical duty in the future?

I would say that such young doctors should look at this experience as an enormous challenge, both personally and professionally. The doctor must be ready to improvise. We tend to become spoiled in the luxury of our 20th century American lives. Duty in a forward unit brings us back to what most of the world's population encounters on a daily basis. Everything we want will not be available. Sometimes some real Yankee ingenuity is needed to get the job done.

It sounds like there's a story behind that remark.

Well, there is, although in retrospect I'm not entirely proud of the episode. Before the Normandy Invasion in World War II, I was assigned to a beach battalion and was scheduled to take care of casualties on an LST after getting off the beach. The LSTs had no operating areas, which I thought should be provided. It so happened that I found some "unused" steel lying on a dock, unofficially "requisitioned" it, and with some help welded together a raised operating room on the after end of the tank deck. It was the only time I was ever threatened with a court martial during my Navy career. They, of course, dropped the charges, for within days I was headed for the beach. It so happened that we used the operating area for early treatment of several penetrating injuries of the abdomen and chest, but you will not find any operating rooms described on the after end of landing craft.

How many trips did you make to Vietnam?

I went over twice during the war. The second time I went down to the Mekong Delta to see what was going on with the riverine forces. At that time, no one had taken a look at casualty management in the Delta war, and

I actually got to go on some of the operations both with U.S. and Vietnamese forces.

Down in the Delta there was no doctrine for riverine warfare. The last time the American armed forces had any riverine experience was in the Red River campaign in Arkansas during the Civil War. Of course, we had total air cover in the Delta and we could have choppers land even on small craft for casualty pickup. As we would go up these narrow channels, we would get fired upon and there were on occasion five or six casualties in the lead or second boat. But we had such overwhelming firepower that we could push on through.

Did you ever accompany any of the helicopter medevacs?

Several times, both on routine pickups and on so-called "hot pickups" from an active combat zone. Indeed, I made some strong recommendations to the Surgeon General that we modulate the call system for helicopter pickups for it was clear to me that we were putting too many helicopter crews at risk for what turned out to be surgically unnecessary reasons. At one extreme, the corpsman at the scene of the fire fight, quite understandably, wanted early evacuation of even the most minor casualties. He would call for a chopper which would almost always routinely come regardless of the nature of the wound. Many of the injuries could have waited an hour or more without danger to the casualty. At the opposite extreme, I can remember a commander in the Medical Corps who got the Navy Cross for going in with choppers to pick up casualties under fire. I personally saw four of the five casualties picked up dead on arrival.

Judging the seriousness of an injury and the need for immediate evacuation is a complicated clinical decision and one cannot blame a corpsman under



CAPT Eiseman (seated left) confers with fellow surgeons atop a sandbagged surgical bunker at the Vandergrift Combat Base, Quang Tri Province, South Vietnam, October 1968.
Photo courtesy CAPT John H. Stover, MC, USN (Ret.)

fire for errors in judgment. This remains a problem which in part can be solved by good communication with a medical regulating center.

How do you train civilian or peacetime active duty surgeons to manage combat casualties?

This is an important and recurring problem. Because of the inevitable turnover of medical personnel in the military, the corporate memory of the Medical Department is short and very few military officers deployed to a new theater of combat will have ever seen or cared for a casualty under combat circumstances. A few might have had experience in a trauma unit during peacetime, but wartime injuries and,

even more importantly, wartime evacuation policies, make an enormous difference in how such casualties are managed.

In my mind there are two essentials in training future medical officers to function in a combat theater. The first is to teach fundamental principles of trauma and wound care to young physicians and surgeons. This includes the body's reaction to injury, principles of hemostasis, the immune and cytokine response to injury, principles of wound healing, and the physiology of repair. I realize that I'm speaking as a professor of surgery in this matter, but with a good background in principles, a smart physician can soon adapt his environment and the tools he has at

hand to provide the best care possible.

The second method is to make optimal use of your personnel who may have had combat experience as instructors for those being deployed. This is often not easy, but as I have indicated elsewhere, perhaps this is an important role both for reservists and consultants. There is, incidently, relatively little interest among even surgeons in learning about the problems of working within an evacuation system until the guns begin going off. Then there's a frantic scramble to learn.

I would like to go back to your World War II experience. You went into the Navy right after you graduated from Harvard and had a 9-month internship in surgery at Massachusetts General Hospital?

Yes. As soon as the truncated surgical internship was over, I was sent to Lido Beach on Long Island. It was a cold, blowing, snowy day and we trudged through the sand to a big shed where we were separated into two groups, one of which was made up of those of us who were single and had 9 full months of surgical internship. We were dubbed "combat surgeons," a sobriquet that had ominous overtones. We were immediately given duffle bags and marched down a long supply line where all sorts of combat gear were thrown at us. Some was for tropical weather, indicating that we were headed for the Pacific. Other gear was for cold weather so we might also anticipate European duty. At the end of the line we were issued pistols, despite a few tiny voices who reminded the amused supply sergeant that we were doctors.

About 40 corpsmen who had been organized into a beach battalion were then assigned to us and we all marched off to the railroad station with sealed orders. Mind you, we had no preparation. We didn't know how to march but just trudged along beside the corpsmen. We certainly hadn't the slightest idea how to salute or whom to salute.

When we got on the train we opened

the orders and I found that I was headed back to Boston. Any visions of a long stay back among friends were squelched when our railroad car, which had been sealed from the passenger cars, was detached and shunted off to the dockyard. We pulled up alongside an LST, were hurriedly shoved aboard, and within an hour were at sea. I had not been in uniform a week.

You landed with your beach battalion on Normandy on D-Day. What was it like?

Perhaps it was best explained by the remarks of a colleague after we brought our first load of casualties back to England shortly after the initial landing. We went to a bar to have a drink before returning to Normandy. A British gentleman came up to us and said, "Pardon, but I believe you have been over on the beaches. What's it like?" My friend turned and said, "It's terribly noisy and there are crowds of Americans."

In fact, I did very little that any good corpsman could not have done as well. My job was to run across the beach with a six-pack of whole blood on my shoulder. Six units of blood is heavy and I can well remember how it cut into my shoulder and slowed me down, particularly when I had to dive for cover. I spent the day and next night underneath a cliff just beyond the sand, doing little more than first aid and giving IVs. As soon as possible, we sent the casualties back to the ships on LCVPs (landing craft, vehicle, and personnel).

How many times did you go back and forth to Normandy?

I don't recall exactly, but I think it was between six and eight times. We would go forward to pick up casualties at a clearing station, take them back, load up, and go to England.

Did you do much operating once you got back aboard the LST?

Very little for two good reasons. First, it was not the appropriate thing to do. If the casualty required surgery,

Photo by the Editor



Dr. Eiseman today

he should have been kept in France and operated on there. If not emergent, surgery would be postponed until they got the casualty to a hospital in England. The second reason was that I was a very inexperienced "surgeon" with only 9 months of internship under my belt. On one occasion I had to do an abdomen, when a fellow took a round through the belly. There were some German prisoners aboard and so I rounded up some German corpsmen to help my own. We used the steel and canvas self-made OR on the tank deck. I slipped in a spinal anesthetic, quickly rolled the chap over on his back, cleaned his belly, and did a laparotomy sufficient only to sew up an obvious hole in a piece of small bowel. Then I closed before the anesthesia wore off, which was what really scared me.

What did you have in the way of a surgical kit?

We had a khaki roll of instruments with a complete set of hemostats, retractors, and the like. I came to know them well, for in the Pacific they issued us each a new kit for every invasion. When I inquired why, they explained that both the kits and ourselves were written off as expendable for each invasion. I brought one of the kits home and used it in one of my

early dog laboratories doing research in Denver after the war.

What did you do in the Pacific after you were transferred there?

I went directly from Europe to the Pacific after a 2-day layover in the United States and then through the Panama Canal. I made several landings in the Philippines, and put in at Peleliu shortly after the shooting stopped there. Okinawa was my big campaign in the Pacific.

We were being sent back to load up for the invasion of Japan when the bomb was dropped and the war ended. When I hear those who decry the use of nuclear weapons on Japan, I often wonder what my chances would have been had the bombs not been dropped. I would have been on a beach battalion for the Japanese landings.

By the time the war ended you must have had a pretty good grounding in surgery.

No, not in surgery. I had a lot of interesting experiences and learned a lot of handy things, such as how to navigate, how to shoot an antiaircraft gun, and how to survive in a combat situation, but not much about operating or clinical surgery. I was never assigned to a hospital. Most of all, I learned how nice it was to be alive and young at heart.

When I took up my surgical training, I started all over again, but I certainly didn't resent this. After all, as I have told many a young medical officer since, the military medical department during wartime is not primarily or even secondarily a teaching institution. I have had little sympathy for those who complain that their surgical education is interrupted by serving on active duty for a couple of years during a war.

I obviously liked my military experience, for I kept my commission for 34 years before retiring. I started out as a jg and went up as high as I could go in what my grandchildren and children call "upward failure." Yes, it was a career pattern of upward failure. —JKH

Highlights From the Naval Medical Research and Development Command

• Cold-Induced Amnesia

Exposure to moderate or severe cold temperatures is known to cause an impairment of learning and memory, which is termed "cold-induced amnesia." This impediment poses a serious threat to the effectiveness of cold weather operations where Navy personnel must maintain effective cognitive performance while doing increasingly complex tasks with high technology equipment. Investigators in the Thermal Stress Program at the Naval Medical Research Institute (NMRI), Bethesda, MD, are studying the mechanisms by which cold exposure affects memory. They are examining subtle cold-induced changes in brain temperature and neurotransmitter and neurohormone functions *in vivo*, in brain regions whose physiological integrity is known to be critical for normal memory function. In these experiments, observed neurophysiological changes are correlated with alterations in working memory and behavioral performance. Information on the mechanisms by which cold exposure disrupts normal memory will aid in the development of technologies for the treatment and prevention of cold-induced performance decrements and enhance military effectiveness in cold operational environments. (Note: On 19 June 1991, LT Steve Ahlers, Dr. John Thomas, and Donna Berkey of NMRI received the Navy's Best FY90 Independent Research Paper Award for their manuscript "Hippocampal and Body Temperature Changes in Rats During Delayed Matching-to-Sample Performance in a Cold Environment." The award was presented by the Director of the Office of Naval Research at the 4th annual IR/IED Symposium. The paper had previously been selected as the Naval Medical Research and Development Command's top independent research paper for FY90.)

* * *

• NMRI/TD Supports Operation Desert Storm

Early this year, in response to inquiries from the Navy and Marine Corps, the Naval Medical Research Institute Toxicology Detachment (NMRI/TD) at Wright-Patterson, AFB, OH, and the Navy Environmental Health Center, Norfolk, VA, organized a workshop highlighting the hazards of major military operations in and around crude oil and oil refineries. Individuals who had participated in oil spill cleanup operations and oil

industry experts from API, BP Oil, Exxon, Mobil Oil, and Texaco with experience in oil field and oil refinery operations in the Middle East attended the workshop. The group developed recommendations for the international Armed Forces based on their collective toxicological knowledge, occupational medicine and hazardous operations experience, and environmental aging data. They also developed guidance for treatment of Desert Storm personnel contaminated by crude oil or exposed to smoke from burning oil wells or oil refineries. A report was published describing the nature of the oil production and processing hazards in the Persian Gulf region and provided information on toxicological effects, specific hazards, hazard prevention and alleviation, as well as recommendations concerning the effects of oil contamination on patient care and on the disease nonbattle injury load on the casualty care system. The report specifically addressed issues on maintaining shipboard potable water while sailing in oil-contaminated waters.

* * *

• Surfactant Replacement in Patients With ARDS

Adult respiratory distress syndrome (ARDS) is a serious respiratory complication of trauma for which there is currently no adequate therapy. The collapse of pulmonary alveoli and the destruction of lung tissue prevents oxygenation of blood, and severe hypoxemia rapidly leads to death. ARDS was a significant complication of severe combat trauma during the Vietnam conflict and continues to threaten severely injured individuals. State-of-the-art biochemical and genetic engineering efforts have produced a potential therapeutic solution for this serious combat trauma-related complication. Navy-funded researchers at the Scripps Clinic and Research Foundation, La Jolla, CA, have successfully sequenced the human lung surfactant molecule. This work has resulted in the genetic engineering of surfactant peptides that can replace the natural surfactant molecules lost during the inflammatory destruction of lung tissue. This unique therapeutic approach for the prevention of ARDS will reduce the very high mortality (60-90 percent).

For additional information on these or other medical R&D projects, contact NMRDC Code 04 at Commercial (301) 295-1468 or Autovon 295-1468.

Psychological Aspects of Practice at Fleet Hospital 5 During the Gulf Crisis

CAPT Frank A. Mullins, MSC, USN

"Welcome to Saudi Arabia, ladies and gentlemen," the young, wiry marine said. Standing on top of the platform and ladder attached to the back of a vehicle used to disembark military personnel from airliners, he looked every bit the American fighting man in dust-covered cami trousers and tee shirt with the butt of his M-16 flat against his side and the barrel pointing up and out at a 45° angle. He obviously enjoyed the looks on the faces of the newcomers who stepped from the 20th century comfort and technology of the PAN-AM 747 that brought them to this Eastern Saudi Arabia airfield from NAS, Norfolk, VA, into the 95° humid heat of the September desert night. After all, he was an "old hand" of 2-3 weeks in-country and it showed in the confidence of his stature and stride.

Like a goatherd he barked two short orders, delightfully adding "Sir" before and after each, and the first of two main body contingents of Fleet Hospital 5 grabbed their gear, left the plane, and trudged a half mile off the tarmac and along a service road through ankle-deep, powdery sand. All that could be seen were the ghosts and shadows of hangars and helicopters in the distance while heavy vehicles passed close to them on unknown errands. There were pockets of laughter and complaints here and there, but most kept their anxieties and feelings of vulnerability to themselves.

After they stopped, other marines appeared with 1.5 liter plastic "wadi" bottles and the group was encouraged to drink. It would be another 7 hours before transportation to the hospital compound construction site, check-in, gear drawing, and a temporary tent space could be arranged. The 350 men and women lay down for a brief rest just as the Sun rose for another 120°-plus day.

The second main body contingent of 350 would arrive approximately 12 hours later, and Fleet Hospital 5 would be made fully operational in less than 9 additional working

days by the efforts of the 700 additional personnel that arrived to augment the work begun just 5 days earlier by the advanced body of Navy medical and Seabee personnel. There would be injuries and heat casualties during this time, but Fleet Hospital 5 personnel would treat all persons who came for help, including their own, even while they continued to build the hospital of tents and ISO containers.

Background

When the forces of Iraq under the leadership of Saddam Hussein invaded the sovereign country of Kuwait on 2 Aug 1990, the United States responded immediately to the request for protective support from the Saudi Arabian government by deploying the largest expeditionary force in the shortest period of time since World War II. The initial contingent of men and women service personnel was effective in halting Iraq's expansionistic intent at the Kuwait/Arabian border. The suddenness of the American military response in inserting troops, weapons, and material *on the ground* in the direct path of the advancing Iraqi forces forced the Baghdad regime into a defensive stance and provided the first test of the projection of American military power overseas in defense of the nation's and world's vital interests during the post-cold war period.

The U.S. Navy and Marine Corps were assigned the central role in this buildup due to capabilities in rapid deployment with forces afloat, rapid sea transport, and strategy of pre-positioning strategic supplies near potential "hot spots." Navy medicine was assigned the major medical support role through its fleet hospital system on shore in the combat zone, and in its afloat assets in hospital ships and medical departments aboard combatant and noncombatant vessels.

The centerpiece of Navy medical support was Fleet Hos-

TABLE 1
Selected Patient Care Statistics for Fleet Hospital 5
Within Context of Total NAVCENT Care Provided

PATIENT CARE STATISTIC	TOTAL NAVCENT CARE*	FLEET HOSPITAL-5 CARE**	OTHER NAVCENT CARE COMBINED
Total Patients Cared For	60,046	33,289	26,757
Outpatients	53,433	28,942	24,491
Inpatients	6,613	4,347	2,266
Surgical Cases	1,493	584	909
Helo Landings	4,293	874	3,419
Patient Evacuations	3,100	1,501	1,599
Prescriptions Filled		23,019	
Dental Patients		3,125	
Spectacles Ordered		6,332	
Immunizations		12,433	

*Through 15 April 1991—Source: COMUSNAVCENT Medical Reconstruction Report for Desert Shield/Storm. Prepared by Center for Naval Analyses, Washington, DC, May 1991.

**Through 23 March 1991—Source: BUMED-Directed Fleet Hospital 5 Briefing on operations during Desert Shield/Storm.

pital 5, a 500-bed tent hospital with a medical and support staff of over 900 men and women dedicated to care of the sick and injured. From its activation as a hospital command on 12 Aug, until it became fully operational on 11 Sept, this medical facility was assembled from over 400 containers in pre-positioned storage aboard ship by all the medical staff with the technical assistance of Navy Seabees. The medical staff simultaneously provided care and treatment to injured and sick combatants as well as to its own personnel, who were not acclimatized to the 120°-plus Arabian summer heat upon arrival.

Actual construction of the hospital took from 27 Aug to 11 Sept. Initially, Fleet Hospital 5 provided the vast majority of theater hospital-based care and continued to provide, or be involved with, over 50 percent of total care throughout Operation Desert Shield/Storm due to its location and ease of accessibility. While providing this care, Fleet Hospital 5 became the largest, most forward-deployed military hospital, erected in the shortest period of time, in military history. Its deployment provided the first operational test of the fleet hospital system.

Although the medical staff came from a number of medical commands, over 700 of its members came from Naval Hospital, Portsmouth, VA, one of the Navy's largest teaching hospitals serving the largest concentration of Navy ships and shore commands in the country. Portsmouth Naval Hospital made the decision both to commit

its most experienced and senior clinicians to provide quality care, and to protect its Graduate Medical Education (GME) programs. Of the 14 GME programs at the hospital, eight department heads and program managers were assigned to Fleet Hospital 5 with the bulk of their replacements coming from the Naval Reserve community of physicians, many of whom had teaching hospital appointments, in order to provide continuity of care to patients and training to residents. Overall, the hospital was backfilled by approximately 800 reserve physicians, nurses, allied health care providers, hospital corpsmen, and hospital administrators during the crisis.

Could deployment of Fleet Hospital 5 have been done better and more rapidly? The answer is probably, "yes." However, statistics concerning the time of establishment of the hospital in the precombat, high heat-stress Saudi Arabian environment, plus the volume of hospital-based care provided by the command in the theater throughout Desert Shield/Storm from mid-August 1990 through mid-March 1991 when the command was disestablished, made Fleet Hospital 5 the leading success story of Navy medicine for the current decade and guaranteed that its experiences will set the benchmark for the performance of deployable hospitals in the foreseeable future.

In addition to patient care, the command provided over 30,000 hours of combat and medical readiness training to more than 4,000 American and British personnel at the

command and in more forward areas while providing 270 "lessons learned" to facilitate overall medical support and the establishment of Fleet Hospitals 15 and 6 during late fall and early winter.

Table 1 provides a sampling of patient care statistics for U.S. Navy Central Command (NAVCENT) and Fleet Hospital 5. Although analyses of patient care statistics were not complete at the time of this article, it can be reasonably concluded that Fleet Hospital 5 remained the central medical support facility throughout Desert Shield/Storm. While Navy medical support accounted for 90 percent of all inpatient and outpatient care in the theater, Fleet Hospital 5 provided over 50 percent of Navy medical care.

General Psychological Perspectives of Care

Health care is always provided within psychological perspective. The following are observations.

There was consensus that the absence of alcohol and normal liberty led to a reduced number of medical and mental health casualties and hospitalizations. The result was that young adults had the opportunity to reduce their conflicts and frustrations in more healthy ways. It was speculated that mental health contacts were reduced fully one-third to one-half among forces served by the hospital. The long-range benefits in the future to these young adults are not known, however, having successful military service and coping with unusual stress effectively are viewed normally as positive growth experiences. Most will experience an increase in self-esteem and take more responsibility for their futures earlier in life.

A second and related speculation was that junior officers and NCOs provided effective counseling and support down to the squad level for family and occupational emergencies, and they became more effective leaders in the process. Rarely did mental health providers have to evaluate a normal personality in crisis. Because of the extremes of their reactions, it was those persons with personality disorders that filtered through line and more forward non-mental health medical components that presented to Fleet Hospital 5 for evaluation.

The rate of admission for those mental health patients that filtered through was low, and the percentage of patients returning for additional care was negligible. The average length of stay was 3-4 days, and return to duty rates ranged between 94 and 97 percent for all contacts across Desert Shield/Storm. The number of Echelon II mental health patients evacuated to Fleet Hospital 5 during Desert Storm was miniscule. Classic psychiatric disease was low and considered base rate in the population we cared for.

A few Navy and Marine Corps personnel arrived in-country with psychiatric conditions (generally depressions) that should have received a medical board, but overall the screening and availability of Navy medical records appeared very good from the mental health per-

spective. Navy psychiatrists, psychologists, and administrative personnel seemed to have been keeping medical records current and reporting unfitting conditions as required.

Overall, the principles of crisis intervention and combat zone mental health were validated. Consultation with providers at more forward echelons increased their awareness of personality dynamics. Seeing the results of evaluations and hospitalizations in patients returned to duty provided valuable feedback.

A quite informal observation was that the evaluations of these providers on subsequent patients demonstrated a keener awareness of environmental and personality dynamics in presenting symptoms.

Providing combat stress information and training at the hospital and on site in forward areas at units' requests was effective in reducing anxiety while it increased unit morale.

The cognitive set of physicians produced some difficulties. Initially, a number of physicians at Fleet Hospital 5 wanted to airevac some patients who were treatable locally. They assumed this would happen and patients were upset when higher authority within the command overruled their physicians. Theater airevacuation policy changed several times during Desert Shield/Storm and communication of changes was not always instantaneous.

In mental health contacts some physicians from more forward or rear areas transported patients with largely family or marital problems to the hospital for "evaluation, treatment, and/or followup," when the problem could have been resolved locally. Still others evacuated patients for routine ambulatory mental health care, such as a course of treatment for an adjustment disorder that was not unfitting, or counseling for minor stress or adjustment reactions. This was due to lack of awareness that Fleet Hospital 5 was an inpatient facility that had extremely limited ability to house outpatients. Admitting these patients to a mental health bed was not in the best interests of the patient, and staffing did not allow for routine ambulatory mental health care. Consultation with these physicians, whenever possible, corrected these misperceptions.

The pressure to provide routine ambulatory mental health care, or the assumption that it was being provided, remained a minor but continuing problem. As the time between the establishment of Fleet Hospital 5 and the outbreak of hostilities lengthened, the pressure to provide a wider breadth of services and perform more like a community hospital grew. This should be anticipated as individuals' personal, family, and professional lives became more complicated and stressed as the deployment progressed.

Some patients were received on interhospital transfer with minor disorders not unfitting but with the expectation of return to CONUS. The transferring physician had stated the patient would be airevaced when this decision was not the prerogative of that provider. All such patients were admitted as interhospital transfers, but length of stay

was increased by a resistance to treatment generated by their expectation. Their low level of emotionality at admission was heightened quickly by feedback they would be returning to duty. This could have been prevented with more training for physicians in personality dynamics, psychopathology, and airevacuation policy.

Medical support personnel were not immune to the effects of deployment stress. They are also human beings with families, responsibilities to patients and peers, and they experienced conflicting feelings because of their felt divided loyalties. Occasionally, physicians escorted patients personally for mental health evaluations expecting the patient to be admitted. Not admitting such a patient generally led to heightened anxiety in the physician and occasional minor acting out emotionally. Upon further discussion it was usually learned they were uncomfortable with mental health patients in general, and being on deployment with its innate stresses heightened this anxiety while it reduced their discriminative ability to think about treatment and referral of mental health patients in the same fashion as with other patients. The lesson derived was that countertransference issues are more likely to be precipitated in combat zone medical practice and should be addressed as a training matter in military medicine.

Physicians were reluctant to diagnose malingering in patients, even though patient contacts have built-in secondary gain in a combat zone, and there is an increased likelihood of little or no organic findings for presenting symptoms due to the increased stress. This placed the physician in the position of experiencing heightened conflict between his obligations to the patient as a physician and to the military as an officer. A number of more junior staff physicians consulted with the mental health staff concerning felt ethical dilemmas. Generally, treatment strategies were developed that resulted in satisfying resolutions to the provider while fostering return to duty.

There were two main clusters of medical patients where malingering appeared to be a factor in the management of the patient's care. The first group were composed of "somatizers." They were patients with vague aches and pains who had no findings and who then complained of additional difficulties, a number having had a longstanding history. As one senior physician noted, "the acute discovery of chronic processes." The second set of patients tended to develop mild anxieties and/or conversion symptoms that did not meet criteria for diagnosis of a formal psychiatric disorder. With mental health consultation, Fleet Hospital 5 medical staff became *extremely* effective in identifying these patients and developing behavioral strategies in which the patients were returned to duty without direct referral, confrontation, or loss of patient self-esteem. Older physicians and nurses seemed to be more adept at these strategies. This may be attributed to having had broader experience, but it was speculated also that being older allowed them to have greater social stimulus value in the eyes of the patients.

Among mental health referrals assessment of suicidal and homicidal thinking were everyday occurrences. Few had to be admitted for lethality. This complaint was largely a metaphor to bring attention to the patient's felt distress. Almost without exception patients assessed for lethality had either symptoms of, or well-developed, personality disorders that were triggered by psychosocial emergencies such as the threat of termination of a relationship by a love object, having a wife or girlfriend pregnant approaching term, imminently giving birth, or having just delivered the patient's first child. These crises precipitated past feelings generated in faulty family relationships, usually excessive rejection, abuse, or unavailability of parental emotional support during developmental years. Threat of self-destruction, or thoughts of injuring others, brought prompt attention. The majority were returned to duty after evaluation, support, and counseling.

Having unit members as escorts for these patients greatly increased the effectiveness of counseling, as it documented the validity of the patient's complaints while it reassured the patient of continued support by his unit. Including unit escorts in the counseling process allowed the mental health provider to educate and ease anxieties about the patient's behavior and pass that information back to the unit. Those patients admitted typically were exploring alternate methods of dealing with their individual situation within 12 hours under support from the milieu therapy on the ward. Conducted largely by Hospital Corps staff their own age under supervision of the psychiatric Nurse Corps officers, it was the major reason for this quick turnaround. Expectancy of return to duty, repeatedly and explicitly given, was the primary therapeutic strategy.

A small number of patients arrived at the hospital with clear psychotic conditions documented at first contact at a lower echelon but were not provided medications prior to arriving at the hospital. These patients had regressed significantly during a 5-6-day period between admission to a lower echelon facility for a short evaluation period and arrival at Fleet Hospital 5. All these patients were airevaced out of theater after first being stabilized. Their regression, distress, and length of stay at Fleet Hospital 5 was unnecessarily lengthened by the lack of prompt medication.

In summary, the deployment, establishment, and first operational test of a fleet hospital was successful from a medical, psychological, and mental health perspective. Most staff grew personally and professionally from having been challenged by this deployment. There is room for improvement in medical systems issues in future operations. □

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Navy Medicine 1922



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Hospital activities at U.S. Naval Hospital, Charleston, SC, were combined with those of the Navy Yard dispensary in this building, a facility that provided beds for only 68 patients.

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